

REMARKS

Claims 1-69 and 71-74 are pending. Claim 70 is cancelled without prejudice. Claims 59 and 68 are rejected under 35 U.S.C. § 112. Claims 1, 10, 13-15, 19, 21-35, 37-39, 42-44, 47-49, 53-71, and 73-74 are rejected under 35 U.S.C. § 103(a). Claims 2-9, 11-12, 16-18, 20, 32-33, 36-38, 40-41, 45-46, 50-52, and 72 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims. Claims 57-58, 60, 63, and 68 are currently amended.

Claim 59 is rejected under 35 U.S.C. § 112, second paragraph, for not limiting antecedent claim 57. Claims 57 and 58 are currently amended to overcome this rejection.

Claim 68 is rejected under 35 U.S.C. § 112, first paragraph, for reciting received signals are modulated. Referring to Figure 3, and page 19, paragraph [0038], lines 6-21, transmitter 72 receives information bits *Bi* at an input of channel encoder 16'. The information bits are encoded by channel encoder 16', interleaved by interleaver 18', and modulated by modulator 20'. Thus, claim 68 is patentable under 35 U.S.C. § 112, first paragraph.

Independent claims 1 and 31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over applicants' admitted prior art (AAPA) in view of Dettman Introduction to Linear Algebra and Differential Equations 140-143, 166-169 (1974) and further in view of Mueller et al. (U.S. Pat. No. 5,323,322). Independent claims 1 and 31 recite "circuitry for multiplying the signals times a conjugate transpose of an estimate of the channel effect and times a conjugate transpose of a linear basis transformation matrix; **circuitry for selecting the linear basis transformation matrix from a finite set of linear basis transformation matrices; and circuitry for removing the interference between the respective streams.**" (emphasis added). Examiner admits the emphasized limitations are not disclosed by AAPA or Dettman and cites Mueller et al. for these limitations.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. (MPEP § 2143). Applicant respectfully submits that Examiner has failed to establish all three criteria. Thus, claims 1-38 are patentable under 35 U.S.C. § 103(a) over AAPA in view of Dettman and further in view of Mueller et al.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Examiner fails to offer any rationale for combining AAPA with Mueller et al. A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) (Court reversed obviousness rejection involving technologically simple concept because there was no

finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention); *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.).

Moreover, the disclosure of Mueller et al. is directed to a completely different purpose than AAPA. Mueller et al. specifically disclose "The transformation is used to eliminate the unwanted reference receiver clock errors in Y_k leading to a corrected measurement vector y_k ." (col. 18, lines 39-41). These reference clock errors of Mueller et al. are unrelated to signal interference of the present invention. Examiner fails to state how a circuit to correct reference clock errors might be used to remove signal interference. Applicants respectfully submit the two applications are incompatible with each other. Thus, there can be no reasonable expectation that such a combination, even if possible, would be successful.

Finally, Examiner states "Mueller et al. discloses choosing a linear transformation matrix, specifically a Housholder transformation matrix, and using the transformation to remove the interference or reference receiver clock errors." For the record, Mueller et al. are silent on interference. The word "interference" is not found in the disclosure of Mueller et al. Furthermore, Mueller et al. do not disclose "circuitry for selecting the linear basis transformation matrix" or "circuitry for removing interference" as required by claim 1. For all the foregoing reasons, therefore, claims 1-38 are patentable under 35 U.S.C. § 103(a) in view of the cited references.

Independent claim 39 is directed to a method of operating a wireless receiver and recites "receiving signals at a plurality of receive antennas and transmitted from a transmitter, the transmitter comprising a plurality of transmit antennas for transmitting the signals which comprise respective streams of independent symbols and wherein interference occurs between the respective streams and wherein the received signals are influenced by a channel effect between the receiver and the transmitter . . . and removing the interference between the respective streams." As previously discussed, a combination of AAPA with Mueller et al. is

improper. Moreover, Mueller et al. are silent on interference. Thus, claims 39-41 are also patentable under 35 U.S.C. § 103(a) in view of the cited references.

Independent claim 42 is directed to a method of operating a wireless transmitter and recites "a plurality of transmit antennas for transmitting the signals, the signals comprising respective streams of independent symbols and wherein interference occurs between the respective streams; circuitry for multiplying symbols times a linear basis transformation matrix, wherein the signals are responsive to the multiplication times a linear basis transformation matrix; and **circuitry for selecting the linear basis transformation matrix in response to a communication received by the transmitter from the receiver via a feedback channel.**" (emphasis added). As previously discussed, a combination of AAPA with Mueller et al. is improper. Moreover, Mueller et al. are silent on interference and do not disclose "circuitry for selecting the linear basis transformation matrix in response to a communication received by the transmitter from the receiver via a feedback channel." Thus, claims 42-59 are also patentable under 35 U.S.C. § 103(a) in view of the cited references.

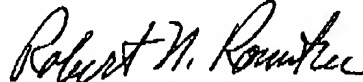
Independent claim 60 is amended to recite "A method of processing signals in a communication circuit, comprising the steps of: receiving a plurality of signals; producing a channel estimate in response to a predetermined signal of the plurality of signals; **selecting a matrix from a finite set of matrices in response to one of the channel estimate and an interference cancellation technique;** and multiplying the plurality of signals by the channel estimate and the matrix." (emphasis added). This method of selecting a matrix is described at page 20, paragraph [0039], lines 16-19 of the instant specification. This method is not disclosed by any of the cited references. Thus, claims 60-67, as amended, are patentable under 35 U.S.C. § 103(a) in view of the cited references.

Independent claim 68 is amended to include the limitations of claim 70. Claim 70 is cancelled without prejudice. Amended claim 68 recites "A method of processing signals in a communication circuit, comprising the steps of: receiving a plurality of signals; modulating the

plurality of signals; selecting a matrix from a finite set of matrices in response to a signal from a remote transmitter; multiplying the plurality of signals by the matrix; and transmitting the plurality of signals from a plurality of transmit antennas." (emphasis added). This method is described in detail at page 20, paragraph [0039] with reference to transmitter 72 of Figure 3 of the instant specification. This method is not disclosed by any of the cited references. Thus, claims 68-69 and 71-74, as amended, are patentable under 35 U.S.C. § 103(a) in view of the cited references.

In view of the foregoing, applicants respectfully request reconsideration and allowance of claims 1-69 and 71-74. If the Examiner finds any issue that is unresolved, please call applicants' attorney by dialing the telephone number printed below.

Respectfully submitted,



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